

ABSTRACTS selected from *Journal of Northeast Forestry University*(in Chinese)

Determination of Thinning Technical Index for Middle-Young Aged Plantations of Korean Pine, Scotch Pine and Larch in Liaoning Province/Wu Yaoxian, Tan Xueren, Song Deli *et al* (Liaoning Forest Management Institute, Benxi 117114, Liaoning Province, China)/J. Northeast For. Univ. -1997, 25(4).-50-55

Fixed position and semi-fixed position study was carried out for determination of the tending thinning technical index of middle-young aged plantations of *Pinus koraiensis*, *Pinus sylvestris* var. *mongolica*, and *Larix* spp.. In combination of forestry production, the beginning period, interval period, stop period, intensity, and methods of tending thinning were determined for the plantations of the three species.

Key words: *Pinus koraiensis*, *Pinus sylvestris* var. *mongolica*, *Larix* spp., Middle-young aged plantation, Tending thinning, Technical index

Cold Resistance of Hybrid Clone of White Poplar/Yang Minsheng, Wang Chunrong, Pei Baohua (Forestry Institute of Hebei Agriculture University, Baoding 071000, Hebei Province, China)/J. Northeast For. Univ. -1997, 25(4).-20-23

With 9 hybrid clones of white poplar as the experimental materials, the relative leakage of electrolytes, relative leakage of K^+ , and the rate of leaf water losing were studied. Growth recover experiment of the clone seedlings was also carried out. The cold resistance abilities of the clones were comprehensively compared according to the studied indices. The results showed that there were obvious differences among the clones of the ability of cold resistance. The abilities of cold resistance on the clones from high to low was MX1, B432, B430, MX2, B431, B414, B429, *P. tomentosa*, B433.

Key word: *P. tomentosa*, Hybrid clones, Cold resistance

Alkaline Extraction Tecnology for Larch Bark/Zhang Lijun, Zheng Zhifang, Han Yudong *et al* (Northeast Forestry University, Harbin 150040, China)/J. Northeast For. Univ. -1997, 25(4).-39-41

This paper is a continuation of the extraction methods of larch bark tannin extract used for manufacture of adhesives alkaline extraction technology for larch bark was further studied. The continuous counter-current extraction battery process which is most widely used in the mill was employed. The optimal conditions of the extraction were determined by crossed test. The operating conditions of extraction system are: alkaline solution placed in the second extractor, coefficient of draw-off liquor 6, non-preliminary dip. In this process the extraction rate of total solid and the concentration of extractive liquor are noticeably increased.

Key words: Larch bark, Extraction technology, Adhesive

A Possible Index for Drought Tolerance-Response Lag (I) /Hu Xinsheng, Wang Shiji (The Research Institute of Forestry,

CAF, Beijing 100091, China)/J. Northeast For. Univ. -1997, 25(4).-1-9

A possible index for measuring drought tolerance, the response lag, was presented. A multilevel factorial experiment was established where temperature, humidity and water stress were varied for *Populus popularis* 44 (Clone C) of drought tolerance and *P. euramericana* 25/28 (Clone D) of drought sensitive by hydroponic method. The instantaneous responses of the net photosynthesis rate (P_n) to photosynthetically active photon flux density (I), which was continually changed according to a pattern of cosine function, were monitored. The response lags were estimated by harmonic wave analysis. Results indicated that the relationship between (P_n) and I was variable, but predictable. With the increase of water stress, the relationship changed from linear to non-linear, and the response time lag from short to long. These response patterns could be modified by different temperature and relative humidity. They were also correlated with clones of different levels drought tolerance. The response lag might be a good predictor for screening clones of drought tolerance.

Key words: Poplar clone, Drought tolerance, Response lag, Temperature, Relative humidity

Estimation of Stem Taper Curve from the Diameter Information at Three Locations on the Stem/Zheng Xiaoxian, Liu Donglan (College of Forest Resources and Environment, Beijing Forestry University, Beijing 100083, P. R. China)/J. Northeast For. Univ. -1997, 25(4).-56-58

The stem taper curve used is 3 degree polynomials that is stated an effective equation. The parameters of this equation are generally decided by the least squares method from diameter measured values at several or many locations on the stem, but can be decided by the simultaneous equations or the least squares method in mathematical stand point if the diameter measured values on the optional locations can be obtained only three. Then we studied about which locations on the actual stem to select as diameter measurement to find out more approximated stem taper curve to the actual stem taper curve from three diameter measured values. We carried out the estimation of stem taper curve using only the diameter information at three locations from the sampling trees of *Pinus sylvestris* var. *mongolica*. As a result, it was suggested that the combinations of diameter information of six kinds is effective from the precision. Moreover, it was suggested that three combinations included DBH are more effective than remaining three combinations from utility.

Key words: *Pinus sylvestris* var. *mongolica*, Stem taper curve, 3 degree polynomials

Features of Layout Design on Hubei Shennongjia Particleboard Factory/Zhang Zhiqing (Northeast Forestry University, Harbin 150040, China), Cao Yongbin *et al* /J. Northeast For. Univ. -1997, 25(4).-77-80

Taking the Hubei Shennongjia Particleboard Factory as an example, this paper described the principle and features of layout desing of particleboard factory in mountainous area, in accordance with the composition of factory, technological process, ues function needed, related technical requirements and taking into considerations of the relations of plane and space among topography landforms surrounding environment buildings

(structures) and every installations.

Key words: Particleboard factory, Layout design, Features

Chemical Control Techniques of Morphological Traits of Korean Pine Seedlings/Li Jicheng, Chen Fangguo, She Hua(Dailing Forestry Bureau, Dailing 153106, Heilongjiang Province, China)//J. Northeast For. Univ. -1997,25(4) -24-29

Trails focused on general second-growth of Korean pine at fixed location and plot were carried out in term of nursery. Nineteen chemical medicaments and 140 chemical control formulae were put to use based on the principle that phytohormones have the ability to regulate plant growth. The result shows: among 140 chemical control formulae, obvious effect was only seen in $1500\text{--}2500\mu\text{g} \cdot \text{g}^{-1}$ and $200\text{--}400\text{mL} \cdot \text{m}^{-2}$ formulae in series A. Therefore, the best choice which has economic and fine effect is to use $2000\mu\text{g} \cdot \text{g}^{-1}$ and $20\text{mL} \cdot \text{m}^{-2}$ in series A and spray one time. It can keep the second-growth rate under 3% and solve the technical problem. A fine day should be selected to spray in the end period of leaves opening up when the height growth has stopped, usually on about July 20. The technique proved to be able to control second-growth of Korean pine seedlings, and it is easy to spread out because of its low costs, simple operation and no affection to field operating.

Key words: Korean pine seedlings, Second-growth, Chemical control

Effect of Forest Cutting on Soil Erosion and River Silt in Xiaoxing'an Mountains Region/Man Xiuling, Liu Jichun, Li Chuanrong *et al* (Northeast Forestry University, Harbin 150040, China)//J. Northeast For. Univ. -1997, 25(4).-35-38

The investigation and determination of soil erosion were made in the representative forest cutover areas of Dailing Experimental Forest Bureau by different degrees of slope and damaged level to soil. The river silt investigation was made at the lower reaches of Tangwang River and the data of river silt of 36 years were collected and analyzed. Soil erosion occurred in varying degrees after the primary Korean pine forest was cut, and it was getting relatively serious on logging road, litter destroyed area and steep slope. Regarding the whole Tangwang river, Forest cutting did not cause the silt content to increase obviously even though forest cutting made soil erosion intensify in some areas. Fast regeneration of forest vegetation and increase of forest coverage play an important role in decreasing silt content of the river.

Key words: Xiaoxing'an Mountains, Forest cutting, Soil erosion, Silt content

Development Potentials of State Forest Areas in Northeast and Inner Mongolia--Development Potentials in Silviculture/Wang Yongqing, Yang Changfeng, Song Caiping(Northeast Forestry University, Harbin 150040, China)//J. Northeast For. Univ. -1997, 25(4) -42-46

Evaluation of potentials in forestry development can provide basis for determining forestry development scale and level and for setting up multiple industrials and rational products structure, and it is also the presupposition of laying down forestry strategy and forestry policies. The development potentials of silviculture industry in state-owned forest area of Northeast and Inner Mongolia were studied in the respects of forest land utilization and

forest land productivity. Plans' optimization and analysis showed that there are colossal development potentials in these both respects. Cardinal suggestions to tap the potentials are proposed. That is to make full use of the program and design about forest land, to improve administration and management, to change administration way, to strengthen fund investment.

Key words: Northeast, Inner Mongolia, State forest areas, Development potentials, Silviculture industry

Principle and Methods for Tending Thinning of Secondary Young and Middle Aged Forest in Xiaoxing'an Mountains/Yu Tianyuan, Liu Wenxiang, Xu Zikun, Han Jiayong, *et al* (Tieli Forestry Bureau, Tieli 152500, Heilongjiang Province, China)//J. Northeast For. Univ. -1997, 25(4) -70-73

Based on the succession law of broad-leaved Korean pine forest, the basic principle of tending thinning to secondary young and middle aged forest is to speed up the recovering of broad-leaved Korean pine forest. The main methods are: (1) thinning broad-leaved trees and protecting conifer trees to natural secondary young and middle aged forest with midiate-high-density, (2) planting conifer(strip, stretch shape or planting group) and thinning broad-leaved trees to that with lower density, (3) calculating the average distance between remaining trees by means of square disposition according to the tree number of different species and diameter which must be kept. The calculation of average distance between trees can be used to control stand density.

Key words: Secondary forest, Young and middle aged forest, Thinning broad-leaved and protecting conifer, Planting conifer and thinning broad-leaved

Mechanism and Physiological Effects of Fertilization on Dahurian Larch Seedlings/Song Jinghe(Northeast Forestry University, Harbin 150040, China), Wang Changan, He Chongshuai *et al*//J. Northeast For. Univ. -1997, 25(4).-10-14

Varied compound fertilizers and dosages were applied to *Larix gmelinii* (Ru Pr.) seedlings. The contents of chlorophyll of the seedlings were determined during different growth periods, and the dynamic changes of N and P contents were analyzed. In fast growing period, the seedlings grow fastest in height and their biomass and chlorophyll contents were also the highest. The fertilizing regime $A_{3(4)}$, $B_{4(3)}$ and C_2 have best effects on chlorophyll content of seedlings. The content of chlorophyll decreased relatively in last growth period and fertilizing regime A_4 , B_1 and C_1 have best effects on it. In the growth periods, the contents of N and P of seedlings depend on not only the different compound fertilizers and dosages, but also the status of taking up and making use of nutrients in soil, and their growth rhythm with different phenological phases as well.

Key words: Dahurian larch, Seedlings, Physiological effect, Fertilization

Perennial Afforestation of *Pinus sylvestris* var. *mongolica* by Soil Preparation of Small Perpendicular Pit/ Dai Jixian (Saihanba Mechanized Forest Farm, Weichang 068466, Hebei Province, China)//J. Northeast For. Univ. -1997, 25(4).-15-19

The designed size of planting perpendicular pit is $25\text{cm}(\text{length}) \times 20\text{cm}(\text{width}) \times 35\text{cm}(\text{depth})$. A plastic tube used for

protecting seedling is adopted. The main root of seedlings is grown into 50-60 cm in depth from ground by using a planting shovel of 30 cm in length. Planting in this way, the survival rate of *Pinus sylvestris*[11] var. *mongolica* planted in different seasons all reached above 85%. The autumnal seedlings planted in small perpendicular pit with plastic tube need not cover up with earth, and they can tide over the cold and gale blowing weather safely.

Key words: *Pinus sylvestris* var. *mongolica*. Afforestation technique, Soil preparation, Small perpendicular pit, Seedling plastic tube

Analysis on the Cause of Catastrophic Flood in South Yichun/ Wang Yu(Dailing Hydrologic Station, Dailing 153106, Heilongjiang Province, China), Wang Fengyou Li Zhenbin *et al* //J. Northeast For. Univ. -1997, 25(4) -30-34

The catastrophic flood that happened in the southern part of Yichun, Heilongjiang Province, on July 29, 1996, was investigated. The results showed that the flood arised once by fifty to hundred years and the main reason was the large area rainstorm. Forest played an important role in reducing the flood. Forest quality is the key factor for reducing flood. This paper raises some countermeasures to prevent the flood.

Key words: South Yichun, Rainstorm, Flood, Forest function, Reducing flood function, Countermeasure

Ecological Condition and Growth Regularity of *Thuja koraiensis*/Meng Fanhua(Zhanyu Forest Station, Tongyu County, Tongyu 137200, Jilin, China)//J. Northeast For. Univ. -1997, 25(5) -50-52

The standard trees of *Thuja koraiensis* Nakai were analyzed by means of investigation of plots. The natural growth regularity and ecological condition of *Thuja koraiensis* were studied in the colder mountainous areas with high elevation. Above ground biomass of the stand were estimated by measuring stem, branch, bark and leaves. The studied results provides theoretical bases for rational exploiting and utilization of *Thuja koraiensis* stand.

Key words: *Thuja koraiensis*, Ecological condition, Growth regularity, Standard tree, Biomass

The Biomass of Intensive and Extensive Cultured Poplar Plantation/Zhu Chunquan(The Chinese Academy of Forestry, Beijing 100091, China), Liu Xiaodong, Zhang Qi *et al* //J. Northeast For. Univ.-1997,25(5).-53-56

The biomass and its allocation in all kinds of organs(branch, stem, leaf and root) was studied in intensive and extensive cultured poplar plantations. The relationship between growth factors (Height, Diameter at breast height) and biomass was established. Combined the volume data, the dynamics of stem biomass and total biomass in two plantations were studied. The results showed that the effects of cultivation measures on the production of biomass were significant in the two plantations. The value of biomass and its distribution in all kinds of organs were higher in intensive plantation than in extensive culture one. So intensive culture measures should be taken in managing poplar plantation and the suitable age for cutting is at about 13 years.

Key words: Intensive culture, Extensive culture, Poplar planta-

tion, Biomass

Pathogen of the Needle Blight of *Pinus sylvestris* var. *mongolica*/Li Pengfei, Hui Enxian, Zhang Ximing *et al* (Animal and Plant Quarantine Bureau of Manzhouli, Inner Mongolia, China)//J. Northeast For. Univ.-1997, (25)5.-34-37

Wither fallen leaves on a large of area in *Pinus sylvestris* var. *mongolica* stands along China-Mongolia border were found in 1989. The growth of the tree and the product of cones and seeds were affected greatly. Through isolating of pathogen and artificial in-duced disease experiment from 1994 to 1996, it was found that the disease was needle blight caused by *Septoria pini-pumilae* Sawada and *Dothistroma pini* Hulbaary. The pycnidium of *Septoria pini-pumilae* Sawada is globular shape. Its size is 119.1-323.4 μ m. It is 176-249.9 μ m high. The conidiophore has no colour, with the size of 8.8-20.52 \times 2.9-5.7 μ m. The conidium is colourless, with the of 7.5-46.9 \times 2.9-5.9 μ m, separated into 3-5 parts. The acervulus of the *Dothistroma pini* is black, with the size of 111.1-222.2 \times 133.3-488.8 μ m. The conidium is white, line shape, with the size of 17.3-39.5 \times 2.7-4.2 μ m, separated into 2-6 parts.

Key words: *Pinus sylvestris* var. *mongolica*, Disease; Needle blight, *Septoria pini-pumilae*, *Dothistroma pini*

A New Record of *Aphytis* Howard (Chalcidoide: Aphelinidae) from China/Li Chengde, Sun Fan (Northeast Forestry University, Harbin 150040, China)//J. Northeast For. Univ. 1997,25(4).-68-69

A new record, *Aphytis testaceus* Tshumakova, from China was reported. Distribution: Harbin City, Heilongjiang Province. Host: *Diaspidiotus alba-atensis* Borchs. on Asian White Birch.

Key Words: *Aphytis*, *Aphytis testaceus* Tshumakova, New record, China

Control Threshold of Willow Oyster Scale/Liu Kuanyu (Northeast Forestry University, Harbin 150040, P. R. China), Liu Junxia, Yan Shanchun, *et al* //J. Northeast For. Univ.-1997, 25(5) -1-4

The control threshold of willow oyster scale *Lepidosaphes salicina* Borchs) was studied based on the current management level of poplar plantation. 16% loss of timber volume was considered to be the first allowable level of control threshold and the relevant insect density is 14.7 heads/cm². Protection and use of natural enemies are first consideration to control the pest when the insect density is under the first level. Artificial control methods should be adopted while the insect density reached this level. 30% loss of timber volume was defined as the second level of control threshold, with an insect density of 21.93 heads/cm². For this insect population density, artificial migration of natural enemies should be used, with combination of artificial control methods. 60% loss of timber volume with an insect density of 37.39 heads/cm², was defined as the third level of control threshold. For this damaged level, the control measures in combination of artificial control and chemical control should be used. The serious infected trees must be cut in order to eliminate the pest source. Much attention should be paid to natural enemies when chemical control is adopted.

Key words: *Lepidosaphes salicina*, Control threshold, Insect

density

Phytoecdysones in *Ajuga multiflora* and *A. linearifolia*/Qiu Zhiguo, Chi Defu(Northeast Forestry University, Harbin 150040, China), Bela Darvas *et al* //J. Northeast For. Univ. -1997, 25(5).-85-86

The phytoecdysones in the methanolic extracts from *Ajuga multiflora* and *A. linearifolia* were isolated and analysed by using high-performance liquid chromatography. 20-OH ecdysone, cyasteron, 20-OH ecdysone-3-acetate, 20-OH ecdysone-2-acetate and Ajugalactone have been detected in these species. The quantity of those compounds were also reported in this paper.

Key words: *Ajuga multiflora*, *Ajuga linearifolia*, High-performance liquid chromatography, phytoecdysone

A Preliminary Appraisal of The *in Vitro* Digestion Method/Chen Huapeng, Li Feng, Sun Zhongwu *et al* (College of Wildlife Resources, Northeast Forestry University, Harbin 150040, P. R. China) //J. Northeast For. Univ. -1997, 25(5).-81-84

In this study, we evaluated the influence of three factors (the type of incubator, the concentration of pepsin solution and inoculum sources) on the accuracy of the *in vitro* digestion method using five types of forages (twigs and leaves of aspen, sedges, forbs, and ferns) in trials. The results showed that there was no significant difference in *in vitro* dry matter digestibilities (IVDMD) of five types of forages when the water bath and the drying oven were used as incubators or two kinds of concentrations (2.3% and 4.6%) of the pepsin solution were used in the trials. No significant difference was found either, in IVDMD of five types of forages when inocula were taken from domestic sheep, wapiti (*Cervus elaphus*) and roe deer (*Capreolus capreolus*), respectively. It is suggested that inocula from domestic sheep, instead from wapiti and roe deer can be used *in vitro* digestion trials for measuring IVDMD of forages used by wapiti and roe deer, especially in some cases where emphasis is put on comparing and assessing the relative nutritional values of forages used by wild ruminant species like wapiti and roe deer.

Key words: *In vitro* digestion trial, *Cervus elaphus*, *Capreolus capreolus*

Spacial Distribution Pattern of *Lepidosaphes salicina*/Lin Tong, Yan Shanchun, Shao Jingwen(Northeast Forestry University, Harbin 150040, China) *et al* //J. Northeast For. Univ. -1997, 25(5).-97-99

The spacial distribution pattern of *Lepidosaphes salicina* was investigated in the Hongqi Forest Farm, Daqing City, Heilongjiang Province In 1993. The spacial distribution pattern of *L. salicina* population was determined by frequency comparative χ^2 test and several indices of aggregation. Results indicated that the population of *L. salicina* fitted basically the negative binomial distribution and Neyman distribution. Tests with indices of aggregation demonstrated that the population of *L. salicina* fitted the aggregation distribution.

Key words: *Lepidosaphes salicina*, Spacial distribution pattern, Aggregation distribution

Visual Trapping Experiment of the Flies, *Strobilomyia* Spp. (Dipt. Anthomyiidae) Damageing Larch Cones/Yan Shanchun(Northeast Forestry University, Harbin 150040, China), Zhang Xudong, Hu Yinyue *et al* //J. Northeast For. Univ. -1997, 25(5).-29-33

A research on visual trapping experiment of the flies, *Strobilomyia* spp. infesting Larch cones was carried out at three sites in Daxing'anling, northeastern China in 1996. *Strobilomyia melaniola* (Fan) is the dominant species among the 6 species flies damaging larch cones. *S. luteoforceps* (Fan & Fang) was caught for the first time in Daxing'anling. Species and sex specific response of flies to trap color and trap position were observed. The sex ratio of each species and the ratio among the species of the flies varies in different years and different sites. The effects of blue cup traps hanged upside down on the canopy trapped more flies than that of yellow board traps placed in front of the trees, and blue cup traps hanged on the south of the canopy trapped more than those the east, west and north of the canopy.

Key words: Larch, *Strobilomyia* spp., Visual trapping

Control of Osier Weevil Using RH-8954 Oil Liquid Formulation/Chi Defu, Miao Jiancai(Northeast Forestry University, Harbin 150040, P. R. China), Pu Jinxiang *et al* //J. Northeast For. Univ. -1997, 25(5).-22-24

Osier Weevil (*Cryptorhynchus lapathi* L.) is a world wide gregarious pest of poplar trees. RH-5849 oil formulation, a new type of insect growth regulator, has been developed for control of osier weevil. Over 95% of the larvae of the osier weevil were killed by painting 1% RH-5849 oil liquid. This pesticide proved to be a safe, high-effective and economic formulation for control of borers with no environmental pollution and no damage to natural enemies of osier weevil. It is suggested RH-5849 can be put into practical use in control of borers on osier weevil.

Key words: RH-8954, Oil formulation, Osier weevil

Supercritical Fluid-Aided Modification of Wood/Qian Li Jian(Northeast Forestry University, Harbin 150040, China) //J. Northeast For. Univ. -1997, 25(4).-59-63

The paper gives an explanation of the processing concept of supercritical fluid. With emphasis on the supercritical fluid modification of wood, the applications and potential techniques in wood industry were reviewed. Some progress was made about the research work of this field in China.

Key words: Supercritical fluid, Wood modification, Supercritical fluid, Wood modification

(Responsible Editor: Chai Ruihai)